WATER

HYDROLOGICAL DATA

GROUND WATER RECONNAISSANCE AND
DRILLED WELLS STUDIES
IN THE KETCHIKAN AREA

ALASKA DEPT. OF HEALTH
SECTION OF SANITATION & ENGINEERING
JUNEAU - ALASKA

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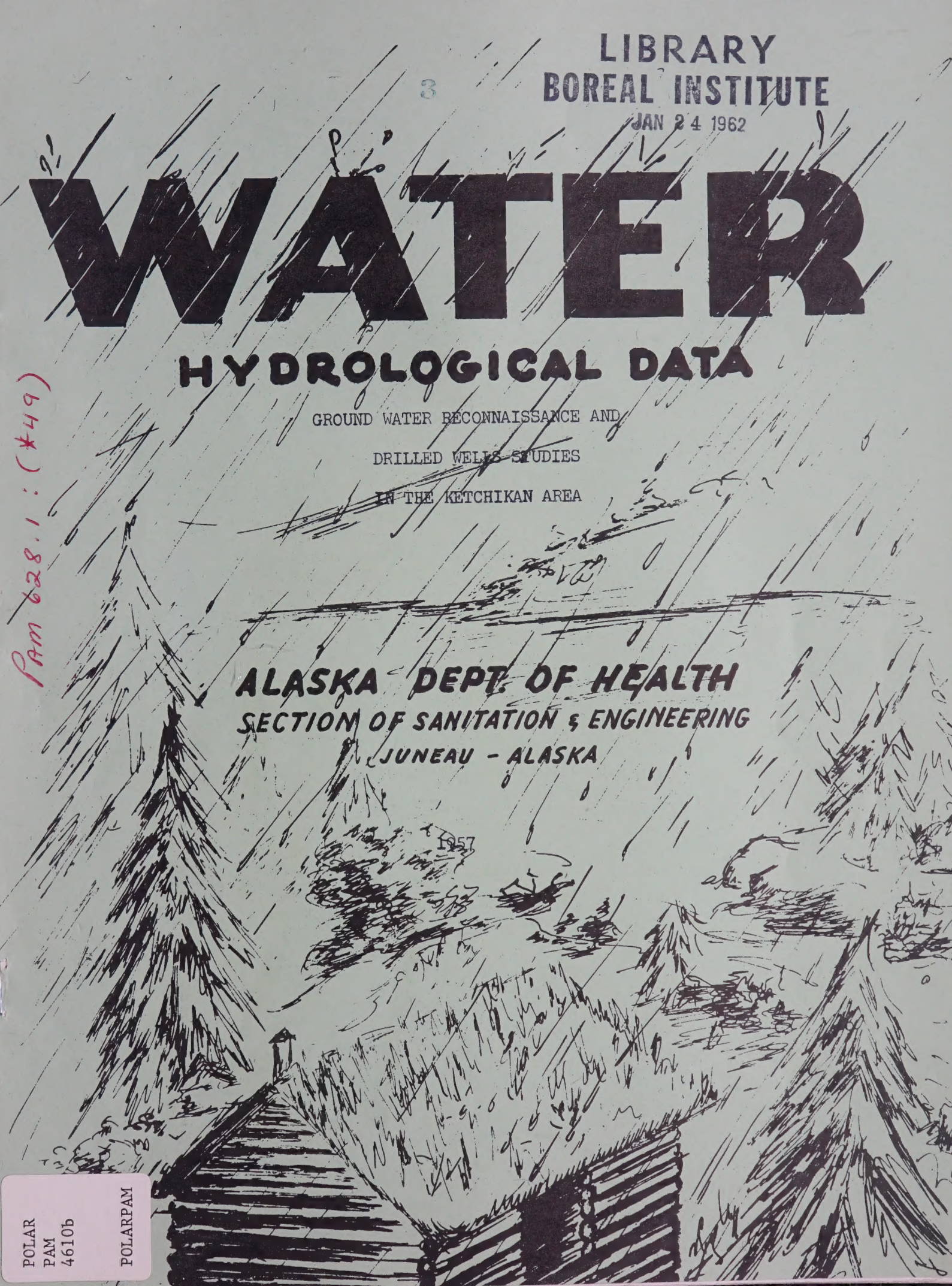

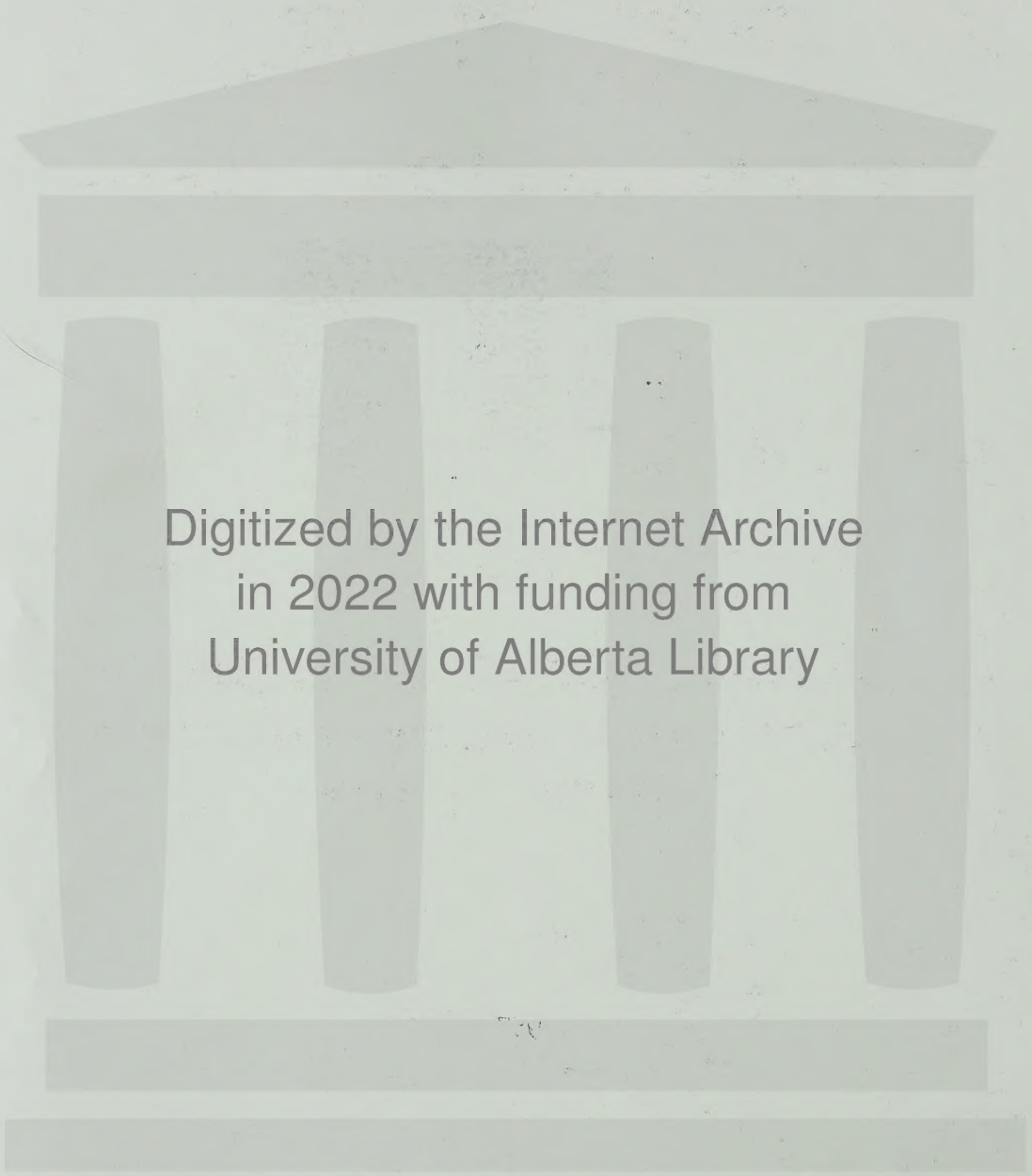

GROUND WATER - KETCHIKAN AREA

Drilling for ground water supplies has progressed materially in the Ketchikan area in the past six months. It has been gratifying to this community to have the services of Mr. Jesse Snyder and crew of the Alaska Drilling Corporation.

Before reporting on the results of the well drilling operations in this area a brief resume on the geography and surficial geology should be made.

Ketchikan is located on Revillagigedo Island in Southeastern Alaska, east of Prince of Wales Island. The area is characteristic of the rugged hard-rock region of high relief and the narrow low terrace on the sea as typical of the many large and small islands of Southeastern Alaska. As unconsolidated stream and glacial deposits are quite sparsely distributed, ground water developments in the area will necessarily depend on obtaining water from one of a variety of hard rocks and the yields will consequently be low. The area along the coastline northwest of Ketchikan is underlain by Cretaceous and Jurassie intrusive rocks predominantly granite associated with extrusive rocks (volcanic greenstone) and metamorphic rocks. Beyond the Whipple Creek area, the bedrock is predominantly slate interlayered with sandstone of Triassic age. Southeast of Ketchikan, the bedrock is classified as greenstone volcanics of Cretaceous or Jurrasic age. Associated with these extrusive rocks are pyroclastic rocks which are fragmental products of igneous activity and their consolidated equivalents.

In general, the development of adequate ground water supplies in the Ketchikan area will depend upon the degree of fractured rock encountered. As bedrock contains fewer fractures at depth, it would seem advisable that the lower areas in the topography and the gentler slopes should have first preference for drilling. There are areas which appear favorable for the occurrence of modest ground water supplies but it is impossible to predict with assurance the presence of useful ground water supplies at individual localities without resorting to actual drilling operations.

The Whipple Creek area which is approximately 8 miles northwest of Ketchikan is the site of a number of completed wells. The best producer in this district currently is on the Walt Begalka property, Pond Reef Road, Lot No. 25. The yield is better than 200 gph from fractured rock consisting of brownish-red schist and sandstone. Another well on Lot No. 17 Pond Reef Road, obtained water at the rate of 90 gph from sandstone at 32 feet.

On the Irvin B. J. Schlais property, Pond Reef Road, a well

drilled to 53 ft. yielded water at the rate of 60 gph from fractured diorite apparently intrusive from the Coast Range.

The Lee Cowan drilled well located on Lot No. 40, Pond Reef Road, is producing water at 45 gph at 31 ft. from fractured schist.

The Harry Selig well, Pond Reef Road, is producing at the rate of 30 gph at 50 ft. from brownish-red schist.

A well drilled in fractured fine-grained igneous rock at 32 ft. yielded water at the rate of 100 gph at Mile 12, N. Tongass Highway (Roman S. Keleske property).

At Mile 11.5 N. Tongass Highway (Earl C. Patrick property), a 200 gph well is yielding water of very good characteristics at 50 ft. from fine-grained granite (as reported on the well log). This rock could be rhyolite since the rhyolites are fine-grained and usually light in color.

A well drilled at Mile 11.3 N. Tongass Highway (R. K. Alleman property) in schist at 54 ft. yielded only 8 gph.

Another low yield producer is the well drilled in schist on the property of Edward J. Burns (South Point Higgins Road). This well is yielding about 2 gph at a depth of 100 feet.

L. C. Thompson's well at Mile 4.5 N. Tongass Highway is producing 60 gph from a depth of 54 ft. in fractured hard dense rock with slaty partings.

At Mile 6 S. Tongass Highway on the property of Arthur L. Wright, a well drilled to 127 ft. yielded water at the rate of 45 gph in fractured greenstone.

A water sample submitted to the laboratories of Fairbanks, Morse & Company in Portland, Oregon from the L. C. Thompson well at Mile 45 N. Tongass Highway revealed the following:

Total Hardness as $CaCO_3$	714 ppm
Iron (Fe)	8.0 "
Manganese (Mn)	5.0 "
pH	7.1 "
Turbidity	35 "

This water analysis report indicates considerable hardness and abnormally high iron content. The only alternative for this water is chemical treatment and to assure efficient ion exchange during treatment the water should be filtered.

It is not known at this time whether other wells in the locality are subject to this degree of hardness and iron and manganese content.

The shallower wells (15 - 16 ft.) show much less iron content (0.77 - 3.0 ppm) and the $CaCO_3$ hardness varies from moderately soft (49 ppm) to very hard (166 ppm).

It would seem important that chemical analysis be accomplished on the water from all wells drilled since there is no other way to ascertain whether or not the water obtained should receive treatment prior to use. The sooner the chemical analysis from a given well, the sooner the property owner can plan the incorporation of the necessary treatment facilities for the given water distribution system. Wells producing iron water gradually get worse and the water eventually becomes unfit for use without iron removal treatment.

Frank O. Booth
Environmental Sanitation Advisor

KETCHIKAN AREA

DRILLED WELLS

Name	Location	Depth (feet)	Static Level (feet)	GPH	Depth Cased (feet)	Date Completed
Irvin B. J. Schlais	Pond Reef Road	53	3.5	60	10	9-9-57
Lee Cowan	Pond Reef Road	31	Flowing	45	10	9-26-57
Harry Selig	Pond Reef Road	52	1.5	30	10	10-2-57
Walt Begalka, Jr.	Pond Reef Road	50	1.0	200	10	10-10-57
Robert E. McKinley	Pond Reef Road	33	10.0	90	32	11-5-57
L. C. Thompson	Mi. 4.5 N. Tongass Hwy.	54	2.0	60	5	9-20-57
Edward J. Burns	Ward Cove	100	---	2	10	9-20-57
R. K. Alleman	Mi. 11.3 N. Tongass Hwy.	54	1.0	8	8	11-22-57
Earl C. Patrick	Mi. 11.5 N. Tongass Hwy.	50	4.0	200	9	10-30-57
Roman S. Keleske	Mi. 12 N. Tongass Hwy.	32	Flowing	100	13	9-3-57
Arthur L. Wright	Mi. 6 S. Tongass Hwy.	127	10.0	45	6	10-23-57

CHEMICAL ANALYSES - WELL WATER - KETCHIKAN AREA

Parts Per Million

Location	Depth of Well	SiO_2	Fe	Ca	Mg	Na	K	CO_3	HCO_3	SO_4	Cl	F	NO_3	Mn	Hardness $CaCO_3$	pH	Date of Collection
Grace Stepp Pond Reef Road	16 ft.	12	.77	34	1	32	4.2	70	--	18	7.8	0	0	0	89	10.5	7-2-55
D. Dolphin	15 ft.	12	3	15	2.7	4.5	1.3	0	58	11	3.5	.1	.6	.37	49	6.3	5-1-55
$3\frac{1}{2}$ Mi. No. Ketchikan	15 ft.	15	2.9	60	3	5.3	.7	-	198	9	2.2	0	.2	2.2	166	7.3	9-24-56

Date Due			

4610 b

Ground
and d
Ketchikan

5 p.

Pam 688.1 : (*49)